

Original Research Article

Comparative Evaluation of the Effect of One Stage Full Mouth Disinfection Versus Conventional Quadrant Therapy in the Control of Chronic Periodontitis in Type 2 Diabetic Subjects – A Clinical Pilot Study

Dr. Roshni Ramesh^{1*}, Dr. Arun Sadasivan², Dr. Sheena P³¹Professor, Department of Periodontics, Government Dental College, Thrissur, Kerala²Professor, Department of Periodontics, Sree Mookambika Institute of Dental Sciences, Kulasekharam, Tamilnadu³Associate Professor, Department of Conservative Dentistry, Government Dental College, Alappuzha, Kerala

*Corresponding author

Dr. Roshni Ramesh

Email: roshni_arun@hotmail.com

Abstract: To compare the effect of one stage full mouth disinfection(FMD) versus quadrant scaling and root planing(Q-SRP)in the control of chronic periodontitis(CP)in type 2 diabetic subjects. 20 type 2 diabetic subjects with chronic periodontitis were selected randomly and divided into two groups(Test group FMD and Control group Q-SRP) based on inclusion criteria. To evaluate the periodontal status, the clinical parameters, Gingival Index (GI), Plaque Index(PI) and Probing depth(PD) were assessed at baseline and 2 months after treatment. Statistical comparisons were performed within groups and between groups. Statistically significant improvements in all the clinical parameters were found in both the groups between baseline and 3 months. The test group showed clinically significant improvement in GI and PD compared to the control group but these results were not statistically significant. Based on the results of the present study it was concluded that both FMD and Q-SRP result in improvements in periodontal parameters. Even though, FMD results in an improved clinical outcome compared to Q-SRP, the results were not statistically significant. Further studies with larger sample size are warranted.

Keywords: Chronic Periodontitis, Full Mouth Disinfection, Scaling and Root Planing, Type-2 Diabetes

INTRODUCTION

Periodontal disease is one of the most prevalent oral diseases. The elimination or reduction of periodontopathogens is the fundamental principle in the prevention and treatment of periodontal disease. This has traditionally been performed by quadrant wise scaling and root planing (Q-SRP). The main disadvantage of this technique is disease recurrence caused mainly due to cross contamination through intraoral translocation. The recolonization occurs because most of the putative periodontal pathogens such as Porphyromonas gingivalis, Aggregatibacter actinomycetem comitans etc are not only found within the periodontal pocket but also in other oral niches like tonsils, buccal mucosa and tongue [1].

To overcome this problem, Quirynen *et al.* [2] have proposed a treatment regimen which claims to be clinically and microbiologically promising in the treatment of chronic severe periodontitis. The main aim of this technique is to eradicate or reduce the amount of periodontal pathogens and to prevent their recolonization. Another advantage of FMD is that

treatment is completed within 24 hours so that multiple visits can be avoided.

Several studies have compared the effect of one stage full mouth technique with conventional treatment [3-5].

Eberhard [6] in a systematic review concluded that FMD had modest effect on periodontal care and the difference with Q-SRP was modest. Other studies have reported that FMD is superior to the conventional procedure [7-9].The results of studies comparing FMD with Q-SRP are still conflicting.

Diabetes and periodontal disease have long been considered to be biologically linked. It has been suggested that periodontal disease is a crucial aggravating factor in the health of patients with diabetes [10]. Numerous studies have also suggested that control of gingival inflammation can contribute to metabolic control [11, 12].

The aim of the present clinical pilot study was to compare the effect of one stage full mouth disinfection (FMD) versus conventional scaling and root planing (Q-SRP) in the treatment of chronic periodontitis in type 2 diabetic subjects with moderate to severe chronic periodontitis.

MATERIAL AND METHODS

Twenty (12 males and 8 females) type 2 diabetic patients with moderate to severe chronic periodontitis with age ranging from 42-63 years were randomly allocated (by block randomization) to test (one stage full mouth disinfection, FMD) and control (quadrant wise scaling and root planing(Q-SRP) groups based on inclusion criteria.

Inclusion criteria

- Participants must have been diagnosed with non-insulin dependent diabetes mellitus for more than one year.
- The presence of at least 15 natural teeth.
- Moderate to severe periodontitis as defined by at least 6 sites of different teeth with an attachment loss of 4 mm or greater with generalised gingival inflammation.
- Physical and mental ability to control plaque to a clinically acceptable level.

The exclusion criteria

- The presence of diabetic complications such as retinopathy, nephropathy, neuropathy, micro and macro angiopathies.
- The presence of any systemic disease other than diabetes.
- Use of systemic antibiotics during the previous two months.
- History of continuous consumption of NSAIDs
- History of scaling and root planing during the previous year

The study was approved by the Institutional Ethics and Research Committee and subjects were asked to sign consent forms and complete a questionnaire regarding personal data and medical history. In the test group (FMD), full mouth scaling was done with ultrasonic scaler in two consecutive visits within the 24 hours to reduce the chance of intra-oral cross contamination. Subgingival irrigation of all periodontal pockets (3 times within 10 minutes) with a blunt tip insulin syringe with 0.2% chlorhexidine (CHX) along with tongue brushing (for 1 minute) and oral rinsing and gargling (for 30 seconds) with 0.2% solution of CHX was performed to reduce the remaining

pathogens in pockets, saliva and tonsils. In the control group (Q-SRP), quadrant wise ultrasonic scaling was performed in four succeeding sessions within a two week interval. The patients in both the groups were instructed to rinse with CHX twice daily for 2 months. All the measurements were performed by one periodontist who was blind to the treatment groups. At baseline and 2 months after treatment, GI, PI and PD were assessed. Periodontal examination was performed using mouth mirror and Williams graduated periodontal probe (Hu- Friedy, Chicago, USA). PD was measured in 4 locations of all the teeth. The patients were recalled every month to check the oral hygiene status and oral hygiene instructions were reinforced if not found satisfactory.

STATISTICAL ANALYSIS

The mean and standard deviation values per site of the clinical parameters for each group were calculated at baseline and after 2 months and grouped per subject per group. The changes in the plaque scores, gingival index and probing depth between baseline and 2 months after treatment were assessed within the groups using the Wilcoxon test and paired t test. The Mann- Whitney test and paired t test was used to determine significant differences between the two groups. *P* values < 0.05 were considered statistically significant.

RESULTS

Twenty patients (12 males and 8 females) participated in the study. The average age of the FMD group was 44 ± 11.38 years and the average age of the Q-SRP group was 47.9 ± 8.6 years that was not statistically significantly different from the FMD group. Table 1 shows comparison of mean Plaque index within and between the treatment groups at 2 months post treatment. Table 2 shows the comparison of mean gingival index and Table 3 shows comparison of mean Probing depths within and between the treatment groups at 2 months post treatment.

For all measurements, there was a statistically significant improvement between baseline and 2 months in each group ($p < 0.05$). PI, GI and PD significantly decreased in both the groups after initial treatment ($p < 0.05$). PI, GI and PD in the test group showed clinically significant improvement after 2 months compared to the control group. However these clinical parameters exhibited no statistically significant differences after treatment between the two techniques ($p > 0.05$).

Table-1: Comparison of Mean Plaque Index Within and Between the Treatment Groups at 2 months Post Treatment

Plaque Index(PI)	FMD		Q-SRP		p value (Between Groups)
	Mean	Std Deviation	Mean	Std Deviation	
Baseline	69	22.1	71	18.32	0.26
2 Months	11	18.23	14	11.02	0.18
p value	0.01		0.01		

p< 0.05, Statistically significant

Table-2: Comparison of Mean Gingival Index Within and Between the Treatment Groups at 2 months Post Treatment

Gingival Index(GI)	FMD		Q-SRP		p value (Between Groups)
	Mean	Std Deviation	Mean	Std Deviation	
Baseline	74	24.3	72	16.76	0.78
2 Months	15.63	11.07	16.3	10.43	0.27
p value	0.001		0.01		

p< 0.05, Statistically significant

Table-3: Comparison of Mean Probing Depths Within and Between the Treatment Groups at 2 Months Post Treatment

Probing Depth(PD)	FMD		Q-SRP		p value (Between Groups)
	Mean	Std Deviation	Mean	Std Deviation	
Baseline	4.38	0.62	4.03	0.78	0.98
2 Months	2.78	0.46	2.89	0.57	0.76
p value	0.001		0.03		

p< 0.05, Statistically significant

DISCUSSION

In the present study, the effects of FMD and Q-SRP on periodontal parameters were evaluated and compared in type 2 diabetic patients with moderate to severe chronic periodontitis.

The results revealed a decrease in periodontal parameters, PI, GI and PD in both the groups after treatment which was statistically significant. The clinical improvement was higher in the FMD group after 2 months but there was no statistically significant difference between the two groups. The results of the present study are in accordance with the studies by Shirmohammadi *et al.* [13], Latronico *et al.* [14], and Camila *et al.* [15], where in the researchers could not find significant difference between the treatment groups. However, the small sample size could have been one of the reasons why a statistically significant reduction could not be obtained even when there was a clinical improvement in the FMD group compared to conventional treatment.

A metaanalysis by Fang *et al.* [16] showed that the weighted mean difference of probing depth reduction was 0.25 mm (p<0.05) for FMD vs Q-SRP in single rooted teeth with moderate pockets, and clinical attachment level gain in single and multirrooted teeth with moderate pockets was 0.33mm (p,0.05) for FMD vs Q-SRP. The authors concluded that FMD was better

than Q-SRP for achieving pocket depth reduction and clinical attachment level gain in moderate pockets. Our study also showed a greater reduction in pocket depth in the FMD group compared to Q-SRP.

It is well known that diabetic patients are at increased risk of developing periodontal disease. Several studies have reported that the metabolic control of diabetes can be altered by controlling gingival inflammation [17, 18].

One stage full mouth disinfection (FMD) has been introduced to avoid cross- contamination between the treated and untreated regions between treatment sessions. Improvements in gingival inflammation can be achieved more quickly using this technique. FMD does not cause remarkable side effects and this technique also reduces the number of therapy sessions.

CONCLUSION

Based on the results of this pilot study, both one stage full mouth disinfection and quadrant wise scaling and root planing are equally effective in improving periodontal parameters. Considering the advantages of one stage full mouth disinfection technique, patient and operator comfort, systemic effects and cost effectiveness, it seems reasonable to infer that the use of this technique in type 2 diabetic patients with chronic periodontitis can be strongly

recommended. Further studies using larger sample size are needed to evaluate whether FMD could give an extra reduction in bacterial load compared to traditional therapy, resulting in a longer infection free period, thereby decreasing the frequency of supportive periodontal treatment

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